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Rainfall Pattern and Cropping System in Coimbatore

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The daily rainfall data for the 25 years period (1953-1977) recorded at Agri-Meteorological observatory, Coimbatore, were analysed for annual, seasonal, monthly and weekly periods and presented in this paper. Based on the rainfall pattern, a suitable cropping system of growing cowpea fodder, two crops of sorghum fodder, redgram and bengalgram has been suggested in the place of growing one sorghum grain crop followed by bengalgram under rainfed conditions.

Coimbatore faces the natural constraints to stable agricultural production, especially in the rainshadow region of Western Ghats, where the annual rainfall is meagre and year to year vagaries are large. For evolving a profitable cropping system in a rainfed tract on a rational scientific basis rainfall analysis is of great help. Balasubramaniam (1958) studied the behaviour monsoons at Coimbatore and reported on the pattern of relationship between south west and north east monsoons. The analysis of rainfall data for Coimbatore area and the suitable cropping system are reported in this paper.

MATERIAL AND METHODS

The daily rainfall data for the 25 year period (1953-1977) recorded at the Coimbatore Agricultural Meteorological observatory are used in the study. The rainfall data were analysed statistically for annual, seasonal, monthly and weekly periods and are presented.

RESULTS AND DISCUSSION

Annual Rainfall - The mean annual rain fall for the 25 year period works out to 638 mm in 45 rainy days. The coefficient of variation for the annual rainfall is 30 per cent. The variation of annual rainfall shows no definite trend or rhythm (Fig.1).

Seasonal Rainfall – The distribution of rainfall in the four seasons with percentage over annual rainfall and the degree of dependability are given in Table I and Fig. 2.

The seasonal distribution of rainfall indicates that 50 per cent of the total rainfall is received during the north-east monsoon period. The dependability of receiving this quantity of rainfell is greater compared to other periods. In southwest monsoon the rainfall received is only 28.5 per cent and in summer it is 20.6 per cent. The dependability of summer rains is more assured than that of southwest monsoon. In winter season the rainfall received is practically negligible (1.8 per cent) and mostly undependable.

Monthly Rainfall - October and November are the months of heaviest

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rainfall contributing together nearly 40 per cent of the annual rainfall. Mean monthly rainfall and rainy days and their contribution to the annual rainfall and the coefficient of variation are given in the Table II and Fig. 2.

The dependability of receiving the rainfall is the highest in the month of October followed by November, May and April.

Correlation was workedout between logarithm of rainfall figures and their corresponding logarithm of CV values. The correlation in this case was negative (r —0.8495) suggesting the high relationship between rainfall and CV. Similar relationship was established by Raj (1973).

Mean weekly rainfall: The mean weekly rainfall is given in Table III and Fig. 3. The data indicate that the rainfall received upto 15th standard week (1 January to 15th April) was low (4 mm/week) and not of much use. From 16th week upto 21st week (16 April - 27 May) the rainfall received ranges from 15 to 22 mm/week and can be utilised for raising a fodder crop within the short period. There is a dry spell from 22nd week to 24th week (28 May 17-June). From 25th week to 30th week (18 June - 29 July) there is some rain followed by a dry spell from 31st week upto 39th week (30 July - 30 September). From 40th week to 50th weekly (1 October-10 December) there is well distributed rainfall which can be used for raising a crop.

Cropping system

The cropping system followed locally in and around Coimbatore is to raise a sorghum crop followed by bengalgram. Based on the rainfall distribution pattern the following cropping system has been suggested (Fig. 3) for better utilisation of rainfall.

The rainfall received between middle of April to end of May works out to 100 mm and it is not utilised for raising crops. During this period cowpea can be grown for fodder purposes and even if it fails it can be ploughed in situ as a green manure crop. After harvest of cowpea the land can be ploughed and kept fallow. After receipt of rain during the last week of June or first week of July sorghum can be sown. The crop will be in the field upto last week of October during which period it can be ratooned depending on the rainfall received during the growth period. Two fodder crops of sorghum or one fodder and one grain sorghum can be harvested by applying mid-term correction depending upon the rainfall and soil moisture. In September, after the receipt of rains redgram can be sown as an intercrop in between rows of standing sorghum. Redgram will come to harvest in January. After harvest of sorghum by the end of October, the interspace available in between rows of red gram can be sown with bengal-

gram in the first week of November. By adopting this cropping system the farmer can get one cowpea fodder, two crops of sorghum as fodder, one redgram and one bengal gram grain crop.

FIG.1 ANNUAL RAINFALL-COIMBATORE.

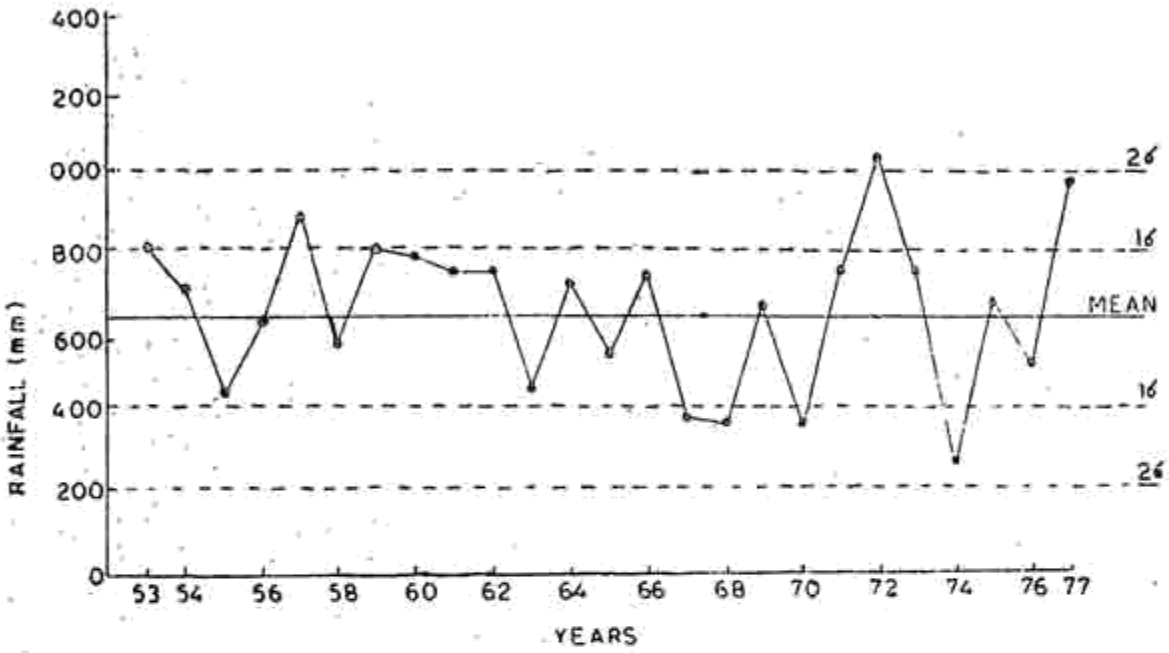
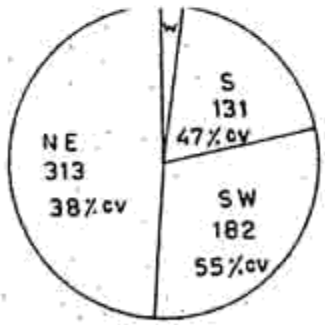


FIG 2 MONTHLY AND SEASONAL RAINFALL-COIMBATORE



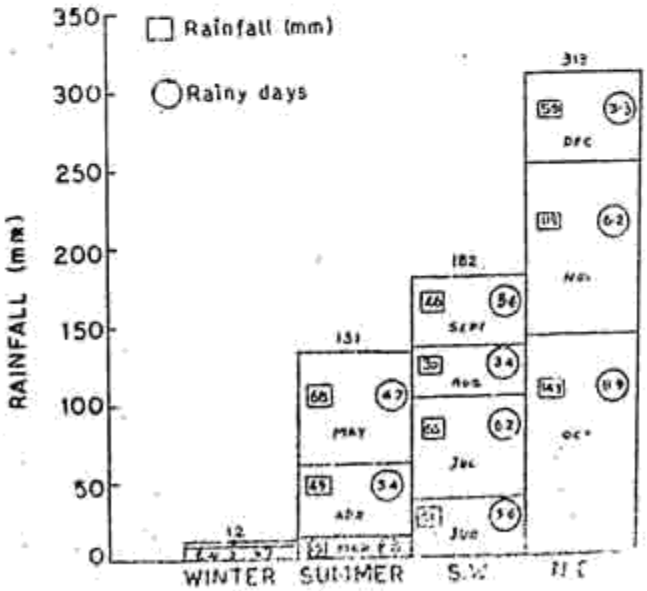


Fig. 3.

MEAN WEEKLY RAINFALL (1953–1977) COIMBATORE AND CROPPING SYSTEM

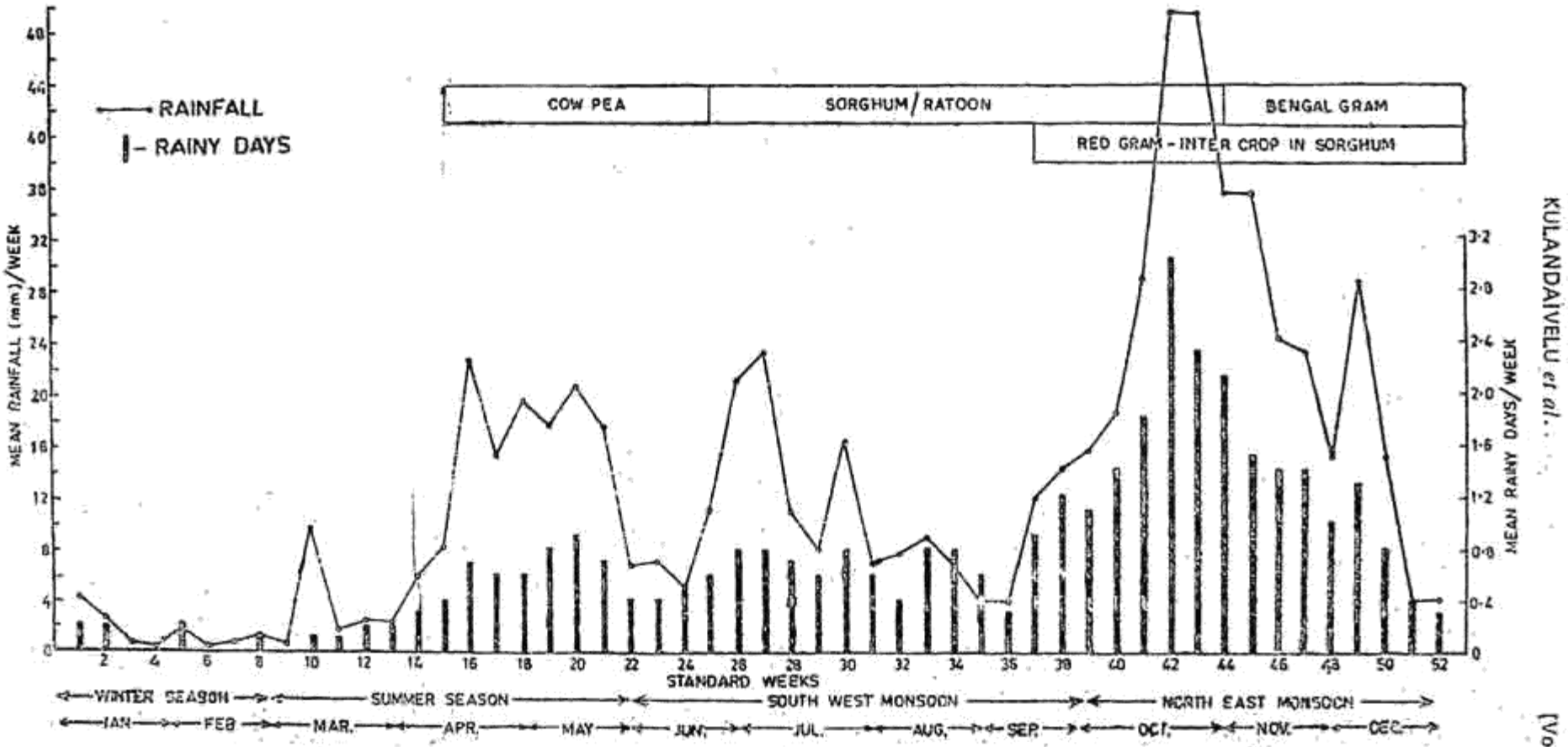


TABLE II Mean monthly rainfall for Coimbatore

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Rainfall (mm)	8.4	3.6	15.1	48.5	67.7	40.5	65.2	30.1	45.8	142.9	110.5	59.4	636
Per cent contribution o annual	1.3	0.6	2.3	7.6	10.2	6.4	10.2	4.7	7.2	22.6	17.3	9.3	
Rainy days	0.7	0.5	0.8	3.4	4.7	3.6	6.2	3.4	3.6	8.9	6.2	3.3	45
C. V. (%)	176	112	92	56	52	76	62	110	68	32	44	80	

Correlation results

Relationship between	Correlation coefficient (r)	Regression equation
Rainfall (y) and CV values (x)	− 0.8495	log y = 2.4328 − 0.3673 log x

TABLE I Seasonwise distribution of rainfall

Period	Amount of rainfall (mm)	Per cent over Annual rainfall	C. V. %
Winter (January-February)	12.0	1.8	128
Summer (March-May)	131.3	20.6	47
S. W. Monsoon (June-September)	181.6	28.5	55
N. E. Monsoon (October-December)	312.8	49.1	38

TABLE III Mean weekly rainfall and rainy days in Coimbatore (1953 – 1977)

Std. week No.	Month	Date	Rain fall (mm)	Rainy days
1.	Jan.	1— 7	4.1	0.2
2.		8—14	2.6	0.2
3.		15—21	0.5	0.0
4.		22—28	0.2	0.0
5.	Feb.	29— 4	1.8	0.2
6.		5—11	0.3	0.0
7.		12—18	0.6	0.0
8.		19—25	1.1	0.1
9.	Mar.	26— 4	0.5	0.0
10.		5—11	9.6	0.1
11.		12—18	1.6	0.1
12.		19—25	2.2	0.2
13.	Apr.	26— 1	3.1	0.2
14.		2— 8	5.9	0.3
15.		9—15	8.1	0.4
16.		16—22	22.4	0.7
17.		23—29	15.4	0.6
18.	May	30— 6	19.4	0.6
19.		7—13	17.7	0.8
20.		14—20	20.5	0.9
21.		21—27	17.3	0.7
22.	Jun.	28— 3	6.8	0.4
23.		4—10	7.1	2.4
24.		11—17	4.8	0.5
25.		18—24	10.9	0.6
26.	Jul.	25— 1	20.8	0.8
27.		2—8	22.9	0.8
28.		9—15	10.9	0.7
29.		16—22	8.1	0.6
30.		23—29	16.2	0.8
31.	Aug.	30— 5	7.1	0.6
32.		6—12	7.8	0.4
33.		13—19	9.1	0.8
34.		20—26	6.9	0.8
35.	Sep.	27— 2	4.0	0.6

36.		3— 9	4.0	0.2
37.		10—16	12.1	0.1
38.		17—23	14.2	1.9
39.		24—30	15.8	1.3
40.	Oct.	1— 7	18.6	1.4
41.		8—14	28.6	1.8
42.		15—21	49.2	3.0
43.		22—28	48.9	2.3
44.	Nov.	29— 4	35.4	2.1
45.		5—11	35.3	1.5
46.		12—18	24.2	1.4
47.		19—25	22.9	1.4
48.	Dec.	26— 2	15.1	1.0
49.		3— 9	28.4	1.3
50.		10—16	15.8	0.8
51.		17—23	4.1	0.4
52.		24—31	4.0	0.3

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